

THE PSYCHOLOGICAL BULLETIN

THE PSYCHOGALVANIC REFLEX

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In recent work on the psychogalvanic reflex (that of the last five or six years), the technique of Féré has been used almost to the complete exclusion of that of Tarchanoff. In using the technique of Féré, one employs an exosomatic source of electromotive force and notes the change in the resistance of the body produced by emotional stimuli. In the experiment of Tarchanoff, the phenomenon considered is simply the electromotive force generated by the body itself, in response to stimulation. That the two phenomena, that of Féré and that of Tarchanoff, may have different physiological grounds is indicated by the findings of Einthoven and Roos (4). They discovered one or two subjects who, while manifesting scarcely any trace of the reflex of Féré, yet invariably showed a marked electromotive response.

It is now known, thanks to the work of Gildemeister, that the apparent decrease in bodily resistance, noted by Féré, consists actually in a depolarization effect. The current sent through the body strongly polarizes the skin. There is thus generated by the skin a current which runs counter to the current from the external electromotive source. Emotional excitement diminishes the degree of polarization and thus, by lessening the force acting against the current which passes through the body from the outside source, causes an increased deflection of the galvanometer. That the actual ohmic resistance of the body does not appreciably change was proved by Gildemeister, through measurements of this resistance by means of an alternating current, in which case the effects of polarization

are reduced to a minimum. No appreciable change in resistance is then produced by even violent emotional stimuli. David (2) has shown that the voltage acquired by the skin may reach a very considerable proportion of that of the current passed through the skin. He arranged to measure the voltage of the skin at an interval of only one two hundred thousandth of a second after the interruption of the external source. He thereupon found that when the external electromotive force was two volts, that from the skin was 90 per cent of two volts; when the external voltage was ten volts, that from the skin was 80 per cent of ten volts. Gildemeister (9) contributes a discussion of the bearing of the results obtained by David upon his theory of the skin as a polarizable structure.

Ebbecke (3) studied the effect of direct excitations—mechanical, chemical, thermal and electrical—upon the skin's resistance to a constant current. He found that such direct irritation of the skin produces a decided decrease in resistance, which is limited strictly to the area stimulated. This reaction is obtainable for hours, perhaps days, after death; and it is suggested that it may in certain cases furnish valuable criminal evidence.

One of the most interesting contributions in the way of technique is that of Wechsler (31 and 32). He has arranged all the apparatus needed in a portable box. It contains a d'Arsonval galvanometer and also clock-work for unrolling sensitive paper on which photographic records are made. With this box, the experimenter, working in a light room, may obtain photographic records of the movements of the galvanometer at the same time that he follows the deflections with his eye. Wechsler, in another important treatise (33), reports a high correlation between the size of the reflex and introspectively judged intensity of affection. Einthoven and Roos (4) demonstrate that the string galvanometer can be successfully applied to the study of the psychogalvanic reflex.

The determination of the physiological cause of the psychogalvanic reflex continues to be the center of great interest. The effects of changes in circulation as a specific cause have been rather decisively outruled. Einthoven and Roos (4) found no perceptible reflex when their electrodes were applied to parts relatively lacking in sweat glands, in spite of a marked vasomotor dilatation. Applying electrodes to the brow, cheek and temples, they obtained neither resistance nor electromotive changes even when the stimuli produced noticeable reddening of the skin. They also found, in agreement with Veraguth, that neither type of reaction was appreciably affected

when, using the fingers as points of contact, the blood was held back by means of Esmarch bandages. Georgi (7) found that a partial sweat bath, though markedly decreasing the resistance of the resting subject, did not particularly affect the magnitude of the reflex. He concludes that a quantitative change in the sweat secretion occurring before the subject is put in circuit has no effect upon the magnitude of the galvanometric deflection produced by an emotional stimulus. Waller (24) notes that the application of an india-rubber band rendering the limb pulseless and exsanguine was without effect upon the reflex.

Waller (24) also made a study of the dependency of the reflex upon muscular movement. He took records, simultaneously, of the galvanometric deflection, recorded photographically, and of muscular movements, recorded by means of a myograph sufficiently delicate to indicate the movements of the pulse. He publishes two illustrations, one of which in particular shows that the emotional response may occur without any fluctuation in the myograph record to account for it. This work seems directly to disprove the theory of Sidis that the phenomenon is due to an electromotive force of muscular origin.

Georgi (7) performed a number of interesting experiments. In one set of tests, he used a boy whose skin was always dry, the palmar surfaces displaying a pronounced, the dorsal surfaces a lesser, keratosis. With this boy, he was unable to obtain even the suggestion of a reflex (using exosomatic voltage), even though it was apparent, from tears, that the stimuli employed were emotionally effective. Another patient, used by Georgi, showed the opposite abnormality, namely, hyperhidrosis, or excessive sweating, of the entire left side of the body. Even in quite cool weather, pearls of sweat would appear on the left half of the forehead, while the right side remained dry. With electrodes placed on the palmar and dorsal surfaces of each hand, it was found that the left hand offered a much lower resistance than the right. Unfortunately the effects exerted by emotional stimuli in the two hands could not be compared, as the subject showed in excessive degree the characteristic "fatigue" or adaptation, which, in nearly all subjects, renders difficult any accurate comparison of the effects of the same stimulus under varying conditions.

The most decisive evidence in favor of the theory that the depolarization reflex is due to the sweat glands has generally been thought to be the abolition of the reflex by atropine. Leva (1913), after trying it on ten subjects, stated that a subcutaneous injection of

1 mgrm. of atropine sulphate left the deflection unchanged for the next ten to fifteen minutes; that it caused the reaction to diminish rapidly after fifteen to twenty-five minutes, and that it abolished the reflex completely, even with the strongest stimulus, after about thirty minutes. The findings of Waller are in direct contradiction to those of Leva. He says that he is unable to find evidence that atropine exerts any effect at all upon the response (25). Markbreiter (14), working in collaboration with Waller, made a special study of this point. She employed two galvanometers, one for the dosed and one for the normal hand, and injected doses of varying amounts up to a maximum of 2 mgrm. The results of this maximal dose were observed by two witnesses. Though the drug took full effect, resulting in great dryness, parching of the throat and headache, upon application of a stimulus the reflex was found to be equally marked in the two hands. Waller studied also the effect of alcohol, chloroform, morphia and pilocarpine; but atropine alone was studied carefully enough, in his opinion, to warrant conclusions (25).

In conformity with his results concerning atropine, Waller demonstrates that the arousal of an emotion is not necessarily accompanied by an increase in the secretion of sweat, either sensible or insensible. This he does by means of a capsule of calcium chloride, which is left inverted against the palm of the hand for a period of perhaps ten minutes, and which shows by its gain in weight the amount of water that has been insensibly exhaled from the area covered by the capsule (25). On the basis of these results, Waller constructs a general theory of the physiological processes accounting for the reflex, as follows: "Admitting as proved that the emotive effect consists in a diminution of resistance, we may take the further step of supposing that the diminished resistance is caused by the expansion of ultra-microscopic pores in the membrane between living element and internal medium, and that polarization at this membrane is diminished. Or quite simply we may imagine that the expanded pores permit of an increased passage of ions."

"I imagine the changes as brought about through what we are accustomed to designate as 'trophic' nerve fibers, and find no necessity for invoking the existence of special emotive as distinct from general trophic channels, nor for assigning emotive effects to sudomotor fibers exclusively, any more than to vaso-motor or muscular-motor fibers (25)."

Prideaux (15) is so impressed with Waller's evidence that he agrees that the depolarization reflex does not depend primarily on the

secretory activity of the skin. He thinks that there remain, as explanatory factors, "only the influence of excitation, through either the cerebrospinal or autonomic nervous system, and changes in the biochemical processes in the skin dependent on them."

Application of the psychogalvanic reflex to the investigation of individual differences has been undertaken by a number of investigators. The reflex varies in magnitude in different persons under similar conditions, and in the same person with the state of health and the time of day. Waller made measurements of the response in a Japanese subject, in which he used two galvanometers, one connected to the forearm and the other to the hand. Concerning the photograms which he publishes, he comments that they are excellent examples of what he is "accustomed from previous observations in European subjects to recognize as the typical response of a normal subject." They show a large response from the hand but little or none from the forearm (29). Waller (23) also publishes a record of the galvanometric variations obtained from a subject during the night of a German air-raid upon London. Only a slight effect was produced by the first warning of the maroons, between eleven and half past; a somewhat greater, but still slight, effect was produced by the anti-aircraft guns; while a third and relatively very great effect occurred at about the time the hum of the approaching aeroplanes became distinctly audible.

Some evidence has been gathered in favor of a correlation between the degree of intellectual development and the magnitude of the psychogalvanic reflex. M. D. Waller, who investigated seventy-three medical students, found that intellectual efficiency, as judged by marks in examinations, was associated with a higher psychogalvanic responsiveness (30). Her conclusions are based on a very scanty statistical treatment of her data, and are rather unreliable, as has been pointed out by Jefferson (12). Prideaux (15) states that the reactions in subjects of poor intellect, as evidenced by their low standard at school, are rarely as marked as in intellectual subjects.

A rather elaborate study of individual differences has been contributed by Smith (18), who studied resistance changes in connection with a list of one hundred words given as stimuli in a free association test. As evidence that the magnitude of the galvanometric deflection is an indication of the amount of affective tone evoked by the corresponding stimulus-word, he cites the mean deflection of each word of his list, for his fifty subjects. The word, *kiss*, heads the list, with a deflection of nearly three times the median deflection. It

is followed in order by the words, *love*, *marry* and *divorce*, all of which gave deflections over twice the median. He combined with his study of galvanometric deflections one of the ability of his subjects to remember the words in the list, after they were once committed to memory. He found that the words which a subject remembered either best or worst were those with larger galvanometric deflections than those remembered moderately well. He concludes, accordingly, that the galvanometer registers equally well two kinds of affective tone: positive tone, the kind which facilitates memory, and negative tone, the opposite variety, which favors forgetfulness.

Smith finds that for quantitative work the galvanometric deflection is superior to measurements of association-time, because it brings out better the differences existing in the affective value of different words. Individuals show marked differences in the galvanic reactions to a suitable list of words, and successive tests of the same individual correlate much higher with themselves (about $+.65$) than do those of different individuals (about $+.15$). Alcohol, taken in the form of whiskey or gin, was found to reduce the absolute magnitude of the reflex in every one of the ten subjects, and also to decrease the mean variation (expressed as a percentage of the mean). Smith regards the variability of a subject's reactions to a set of stimuli as the best measure, and as a "reasonably good" one, of his emotivity.

One of the chief difficulties connected with the use of the psychogalvanic reflex is that of making comparable with one another the reactions observed in different subjects and in the same subject on different occasions. Aside from factors pertaining to the experimental "set-up," which could presumably be kept constant, one should consider, Smith (17) observes, the possibility of variation: (1) in "the proportion of the emotion" which finds expression through those efferent channels which innervate the skin; (2) in the responsiveness of the skin to such innervation; and (3) in the initial resistance of the subject. It is easy to show experimentally that, in general, the greater the current passed through the subject, the greater is the absolute magnitude of his reactions. From measurements on fifty subjects made in the course of his association experiments, Smith calculates that the effect on the absolute magnitude of deflections, produced by differing resistances of the subjects, can be removed by multiplying the deflection by $R .925$ (substantially equal to R , the subject's resistance).

Albrecht (1) working in the ear-clinic at Tübingen, came to the

conclusion that the psychogalvanic technique offered a satisfactory means of distinguishing between organic deafness and psychogenic or simulated deafness. He first determined that in cases of normal hearing words whispered at a distance of four meters regularly produced distinct galvanometric deflections. In cases of complete organic deafness, no reaction occurred, even to loud shouting. In persons hard of hearing, reactions began at that loudness which just exceeded their stimulus-threshold. Prideaux (15) also used the psychogalvanic reflex as "the only trustworthy test to decide whether a deafness is a true organic one or not." Another purpose for which he employed it was that of diagnosing a functional amnesia from an organic one. Of one case, in which the patient had a complete loss of memory for all his war experiences, Prideaux states that he was able, by means of the galvanic reactions, "to trace out roughly the history of the patient's movements during the war, and to determine the place where he was 'blown up'."

In spite of the work of Albrecht and of Prideaux, it remains impossible to be sure of the diagnostic significance of a failure of reaction. It has been known ever since the studies of Binswanger (1908) that inattention to the stimulus used to elicit the galvanic reaction, as in cases of preoccupation with other matters, inhibits the reflex. Goebel (10) points out that in many cases of psychogenic deafness, *e.g.*, hysterical, such inhibitions may very well be active, and that therefore the failure to obtain the galvanic response may not indicate organic deafness.

Georgi (7) found that a subject who ordinarily gave normal reactions, gave them also in hypnosis, providing no suggestion to the contrary was given. When the stimulus was negated by a negative suggestion, it produced no reflex.

That the psychogalvanic reflex may be studied in animals, as well as in man, has long been known. Veraguth in his work published in 1909 remarked that the phenomenon occurs with dogs, cats and toads. Erbs (5), in a dissertation inaccessible to the reviewer, studied the psychogalvanic reflex in the horse and the dog. The phenomenon has been studied in the frog by Schwartz, in 1915, and by Fauville (6), Kohlrausch and Schilf (13) and Schilf and Schuberth (19). Kohlrausch and Schilf (13) extended the observations of Schwartz in that they obtained the reflex with optic stimuli, as well as with pain stimuli. They further observed that dosing with curare, which Schwartz had recommended for the purpose of keeping the frog quiet, may, if sufficiently strong, entirely destroy the reflex, but that

doses just sufficient to render the frog motionless leave the reflex intact. Fauville (6) reports that curare abolishes the reflex. Decerebrate frogs, he found, still display the reflex. Removal of the skin from the limbs destroyed the reflex from the limbs so treated. Ligation of both femoral arteries left it intact, so that the possibility of the reflex being due to vasomotor changes was eliminated. In agreement with the findings of Leva and contrary to those of Waller, in man, he found that atropine abolished the reflex in the frog.

Schilf and Schuberth (19) after performing a number of experiments, some of them confirming the results of previous investigators, finally separated a frog into halves, in such a way that the sole connection between the front and rear halves was made by sympathetic fibers. They isolated the sympathetic in the neighborhood of the sixth vertebra, bound the aorta above and below, then sectioned it, and likewise cut through all skin, muscles and other tissues, including the spinal column and all nerve connections, except the sympathetic. With the frog in such condition, and electrodes applied to the hind limbs, pain stimuli applied to the anterior half produced the galvanic reflex, thus demonstrating beyond question that in the frog the efferent part of the reflex path runs in the sympathetic. The fibers of the sympathetic run in the ischiadicus to the skin. The authors are inclined to believe that the center of the reflex is in the medulla, since they obtained it from some frogs with all of the central nervous system above the lowest fourth of the medulla removed. They hold that the skin-glands of the frog are analogous, so far as their rôle in the psychogalvanic reflex is concerned, with the sweat-glands of warm-blooded animals. General narcosis, produced by chloroform, was found to destroy the reflex.

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RECENT THEORIES OF LAUGHTER

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Studies of laughter and the ludicrous may be roughly classified from two points of view. They are: (a) Genetic and Synthetic—when the investigator seeks either infantile, or the more remote possibly, prehuman origins, and traces the evolution of some primitive function toward Laughter; (b) Descriptive and Analytic theories, on the other hand, represent attempts to explain the phenomena of laughter in terms of the biological and psychological equipment and environmental circumstances of the adult human individual as he exists to-day. In practice no complete separation of the two methods exists, descriptive theorists usually referring to genetic data, and genetic studies culminating in descriptions of adult laughter.

In the second place, theories of Laughter may be (a) Monistic, or (b) Pluralistic, according to whether investigators attempt to trace a common element and reduce all the phenomena of the ludicrous to a single principle, or on the contrary admit a variety of principles, *e.g.*, a number of instincts. The older theorists unconsciously divided along such lines, and recent writers pursue a similar course, although they have added several new alternatives as well as qualifications, in the choice, of unique principles of interpretation.

A tendency to renounce the search for a universal principle in favor of some kind of pluralism seems apparent in recent works. There is likewise a trend away from intellectualist explanations and an increasing disposition to discuss the phenomena of Laughter in behavioristic terms. Finally, interest has shifted from the mechanism and psychological structure of the ludicrous to the functional aspect, of the phenomena considered from a social as well as individual point of view.

A better analysis of the so-called "Problem of Laughter" appears in recent literature, and Dumas (17) shows that there are at least five distinct problems, *viz.*: (1) mechanism; (2) psychophysics; (3) affective psychology; (4) relation to the comic, and (5) social function. As Dumas and Külpe (27) clearly state, Laughter and The Comic are no longer to be confounded with one

another. Since the works of Freud and Bergson have profoundly influenced subsequent studies of Laughter, reference to their contributions may fittingly precede a survey of recent literature grouped according to general type.

Bergson's (6) theory of Laughter is a special application of his general system of philosophy. The comic is whatever is stiff, rigid and automatic. "*Du mecanique plaqué sur le vivant*" is the formula. This automatism is unsocial, and finds its social corrective in laughter which has three principal characters: It is (1) exclusively human; (2) unemotional, appealing purely to intelligence; (3) social. A comic character involves unsociability in the performer, insensibility in the spectator and absentmindedness or automatism. In short we laugh whenever Life descends, or seems to descend, toward automatism, laughter tending to check the descent. Bergson's view is criticized as inadequate by many writers notably Baillie who rejects it completely, and McDougall who calls it inadequate, while Dumas thinks it might cover all the phenomena of the ludicrous. A special criticism is involved in Lloyd's (28) view that the basis of laughter may differ according to race. Latins may find the essence of humor in the detection of mechanism, but for Anglo-Saxons mechanism is never ridiculous in itself. It is only the breakdown of mechanism that causes a laugh. Anglo-Saxons laugh at failure, not at mechanism, though they may be moving toward the Latin standpoint. Jequier (26) also assumes racial differences in the principle of laughter. Anglo-Saxon humor and Latin wit are often mutually incomprehensible, the former involving the absurd or illogical, the latter remaining essentially logical. Bergson's view that laughter is unemotional is followed by Lowenthal (29) who finds a certain personal disinterestedness, remoteness, and intellectual detachment, requisite for the perception of the ludicrous. That laughter is also a social corrective is maintained by Wallis (37) who sees therein its principal function and *raison d'être*.

Freud (18) like Bergson, deduces his theory of laughter from a general system of thought developed in connection with psychoanalysis. Laughter is the analogue of the dream. The mechanisms for wit and dreams are similar, expressions of the ludicrous dealing, however, with less completely suppressed material. Wit, humor and the comic are three different categories of the ludicrous, but have similar formulae. The pleasure of wit originates from an economy of expenditure in inhibition, of the comic from an economy in the expenditure of thought and of humor from an economy of the

expenditure in feeling. Freud is most specific regarding wit in which pleasure is due to (1) freedom from the social restraints of primitive impulses, as well as the restrictions of logical thinking and (2) economy of mental effort. In brief, the ludicrous always represents some economy in the expenditure of mental energy.

Brief statements of Freud's theory of laughter, accompanied by fresh illustrative material, have been made by Holt (24), Brill (8), and Tridon (36), the latter in a simplified popular form.

Bliss (7) develops the implications of Freud's view that laughter is a physical sign of subconscious satisfaction, and reveals unconscious mental tendencies. It is among other things, an outlet of surplus energy, a relief from strain, an indication of suddenly released suppressions and a social corrective. Repressions increase in the course of phylogenesis. Thus animals have no repressions and man as he advanced, was obliged to curb increasingly his original nature, which is in conflict with the social state. The result is a multitude of social inhibitions and repressions. Regarding emotion as tension due to the interval between impulse and action, and accepting the difference between man and animal, just stated, the conditions for laughter appear. Laughter is the result of a suddenly released repression and the expression of unconscious gratification. Primitive man perceiving the socially reprehensible in another, felt similar tendencies in himself, and laughed, thus giving audible record and warning of the social standard.

Closely related to treatments of laughter from the psychoanalytic standpoint are a number of studies which, assuming the release of inhibitions involved in laughter, lay particular stress on the sense of relief or relaxation which accompanies the process.

Thus, Patrick (33) who admits the difficulty of referring all kinds of laughter to one principle, thinks that the element of relaxation is always present. Laughter in the child is the accompaniment of absence of inner tension, in the adult of relief from inner tension. It is associated with play or recreational activities in the widest sense, and is a means of preserving psychic equilibrium. It is a return to primitive freedom, an elementary form of play. This is admitted by McDougall (31) as an explanation of but one type of laughter, viz., high spirits, while Miss Jensen (25), criticizing theories of laughter in the light of classical comedy, decides that "laughter is very often a form of the play instinct." It is "a calling out of the child nature within us."

The most elaborate treatment of laughter from this point of view

is that of Gregory (21) who after surveying previous theories from Aristotle to McDougall and establishing the classification of monistic and pluralistic theories attacks the subject from a comprehensive and evolutionary point of view. Gregory (22) notes the complexity of the phenomena and leans toward pluralism, finding three irreducible types of laughter motivated respectively by animus, sympathy and intelligent appreciation. In the course of history, animus is gradually displaced by sympathy as a source of laughter, this fact being reflected in the historical order of theories of the comic. We thus have what he calls the humanization of laughter. Whatever the type of laughter, however, there is always a common element, viz., a "relief situation." Laughter is always an expression of relief. This view is worked out in detail, accompanied by a critique of previous theories, which are all partially true, and which Gregory correlates and harmonizes in a very suggestive way.

While most of the foregoing studies take some account of origins, a number of writers make the origin of laughter their specific theme. Woodworth (38) declares that we have, as yet, no comprehensive genetic study of laughter, tracing it up from its beginnings in the child, and "that while laughter is a native response, we learn what to laugh at, for the most part, just as we learn what to fear." Nevertheless there are several recent efforts to trace the genesis of laughter both in the child and the race.

According to Crile (11) laughter is confined to the primates and cannot be reduced to a single general principle. The function of laughter is the release of the surplus energy of the kinetic system of the body. Crile (12) further believes that all laughter evolved from the laughter of tickling which is a "recapitulation of ancestral struggles against the attack of biting and clawing foes." It is a substitute for a defense reaction imposed by the need of liberating energy, mobilized in the kinetic organs in response to a phylogenetic stimulus. Images and emotions are also action patterns, which may assume the form of defense reactions and culminate in laughter as a substitute. Thus laughter gradually becomes a response to purely psychical stimuli.

Givler (19) elaborates upon Crile's theory of laughter and combines it with Freud's explanations of various types of the ludicrous. The amount of laughter which an individual indulges in is an index of his repressions. Humor is contagious, but public or mass laughter must move within circles of common information, prejudices, and as

Bartlett (4) points out, even a stereotyped situation is sometimes requisite, particularly among primitives.

A phylogenetic theory of a different kind is advanced by Augier (2) who thinks that laughter is a modern survival of a remote ancestral gesture of satisfaction, associated with preparation to devour conquered prey. The sense of the comic is the result of a transformation of the ancestral joy of conquest. This view, while unverifiable, is not inconsistent with the facts according to Delage (13).

Greig (23) offers an ontogenetic theory of laughter, worked out in great detail. Laughter evolves from the smile which appears for the first time during the feeding behavior of infants, or at the first manifestation of the love instinct. As the latter grows, interruptions become frequent and are accompanied by the mobilization of energy against interruption. The sudden removal or weakening of such interruptions liberates this energy which escapes in the form of laughter. Hate is a secondary development of love, and laughter passes over to it, particularly when the mood of hate is ambivalent, *i.e.*, "restrained by a counter force of love." Greig is influenced by Freud but offers a complete and original treatment of most of the specifically psychological problems of laughter.

A sociological theory of laughter is furnished by Wallis (37) who believes that laughter originated as a means of expressing and maintaining group standards among primitive men. Laughter resembles language in origin and function and like the latter is individually and socially preservative. The stimulus to laughter is anything that deviates from group standards, and the pleasure of laughter is the sense of group unity which it expresses. Laughter is therefore a social corrective, but it may function pathologically in this rôle. It may degenerate into the universal grinning, discussed by Miss Pennell (34) and which she regards as a kind of compensatory mechanism indicating conditions of social unrest or despair. On the other hand it has sometimes been held that laughter and the comic spirit are opposed to morality, *i.e.*, are socially disruptive, a question discussed by Schmalhausen (35) who concludes that only an outworn customary morality suffers in this way.

Another group of writers regard laughter as an instinct. This view is accepted by Gregory provided we have a satisfactory definition of instinct, and is adopted by McComas (30) who declares that laughter is not a reflex as Darwin thought, but a complex, instinctive act. Like crying, it is unlearned, appears at an early age and is of a

physiological rather than a psychological nature. Laughter is an expression of pleasure, and is associated with all instincts involving a pleasant state of mind. Laughter survived as an instinct, because it was useful to the race as a primitive means of communication, a function which it still fulfills in the case of infants.

Eastman (17) holds that laughter is a primary and unanalyzable instinct, originally connected with play and involving what he calls "positive and negative currents" of emotional interest, determining various types of humor. Eastman offers what might be termed a logical technique of humor in the form of eight laws for evoking laughter.

McDougall (31) agrees closely with Eastman. Laughter involves a complex coördination of movements, provided for by innate neural organization. It is, therefore, an instinct, of biological service in producing physiological stimulation, and psychological relief, interrupting fatiguing or depressing trains of thought.

Laughter is therefore not an expression but rather a generator of pleasure. The essential features of the ludicrous are (1) the presence of maladjustment which would displease us if we did not laugh, and (2) a situation which, if we ourselves were concerned, would be distressing, and in which we laugh to avoid the attendant sympathetic pain and depression. Laughter is in brief an invention of nature to counteract the effects of excessive sympathy.

Expression theories of various types have been advanced by several writers. Thus Drever (14) says that "laughter is an expression of joy, which is not an emotion but the character of a whole group of emotions," characterized by the rapid and abundant satisfaction of instinctive factors. Joy emotions may be evoked, by associations, sympathetically, or by empathy. Laughter, moreover, indicates a sudden withdrawal of repressions and a release of primitive impulses. In a later communication Drever (15) retains his theory unaltered, but stresses the difference between biological and psychological theories of laughter.

Kölpe (27) points out that laughter expresses joy and nothing more in connection with a warning that the comic must not be confused with the laughable. Müller-Freienfels (32) notes that a feeling of joy is an accompaniment of the abreaction effected by the reflex act of laughter. Laughter in its various forms is the motor abreaction of many tendencies initially painful, *e.g.*, embarrassment, aggression, sympathy, superiority or suppressed sex impulses.

Beerbohm (5) also appears to regard laughter as an expression of

joy and well being. He is more interested in the evaluation than in an explanation of laughter, claiming that all theories are incomprehensible. Laughter is to be evaluated according to its intensity, the sources of laughter being negligible. He, however, says laughter is usually at, and not with others, that reverence is the richest source of laughter, and that we laugh as we grow older.

An expression theory of a totally different kind is advanced by Carritt (10). Laughter has many sources, but in general the ludicrous is the esthetically defective, *i.e.*, a failure in expressiveness, in Croce's sense of the term. While earlier theorists traced laughter to all forms of error, such as logical, moral, economic, etc., Croce's system would point to esthetic failure as the specific source of the comic.

Early theories of laughter are represented by few writers. The superiority theory of Plato and Hobbes is given a new turn by Carpenter (9) who calls laughter a glory in sanity. We laugh because occasions of laughter permit us to recognize and glory in our own good sense. Laughter is the cry of pleasure at recognizing one's sanity—one's accuracy of judgment. Further, for things to have a comic aspect, they must be perceived (1) as false or deceptive; (2) abruptly or suddenly.

Anthony (1) claims that laughter is, in a general way, the sign not only of "sudden glory" but of every sudden affective state tending toward a maximal intensity, *i.e.*, of joy of any kind. The view is evidently a form of the expression theory. Finally according to Delage (13) surprise, relative to an affect, in disharmony with its cause, which is disagreeable to the person experiencing it, renders the effect comic, for the spectator; or we might say, the perception of an incongruity, disagreeable to another, evokes laughter, if we ourselves can maintain an attitude of detachment.

The view variously expressed from Aristotle to Schopenhauer, that laughter is due to the perception of some kind of incongruity is revived by Baillie (3) and interpreted in the light of modern physiological and sociological data. The perception of incongruity is the primal source of laughter, but where ends are standardized as in social life, we have the permanent conditions of laughter since any departure from social standards is incongruous. Incongruity may arise from Nature, "the designed or undesigned acts of individuals," or from "the free interplay of many persons living together," and occasionally, thwarting one another's purposes. The more universal the social ends involved in an incongruous situation, the more uni-

versal is laughter. The sense of incongruity depends upon a value judgment varying with the time, place and individual, and the value of laughter varies directly with the number who can participate. Laughter is enhanced by social resonance, serves as a social corrective, preserves mental stability or unity in the face of the incongruous, and maintains equilibrium of physiological energy.

Grandgent (20) says laughter is primarily an expression of well-being. In the civilized it is a release from customary inhibitions generally accompanied by surprise, or an expression of abnormal excitability. The most frequent cause of laughter is a sudden sense of incongruity, the most common effect, relief.

Critical reviews of the problems and theories of laughter are offered by Dumas (15) and Jecquier (26). Dumas (15) notes the distinction between laughter which transmits general pleasure, and that which expresses pleasure in the comic. There are at least two kinds of laughter, physiologically the same, but psychologically different. Laughter constitutes a social language directed by defensive and disciplinary motives. Existent theories of laughter afford no complete explanations, but Bergson's seems to afford possibilities of widest application.

Jecquier (26) reviews the principal theories of laughter, summarizing them in concise formulae. The various theories of laughter are simply laws describing certain limited classes of the ludicrous, mistaken for explanations of the phenomena in their totality. There is no common cause of all varieties of laughter, and no adequate theory of the comic.

The review of recent literature suggests that laughter is a primary activity of Protean aspect. It is a complex form of behavior, unlearned yet highly susceptible to conditioning in the presence of psychic stimuli. It is at once a biological mechanism of adjustment, a physiological safety-valve, a psychological exhilarant and a regulator of social relations.

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SPECIAL REVIEWS

EDGAR ARTHUR SINGER. *Mind as Behavior*. Columbus, Ohio: Adams, 924. Pp. ix+293.

This book brings together a considerable number of papers which have appeared from time to time in the philosophical magazines. It is of special interest to the psychologist in calling attention to the fact that the author advanced a behavioristic conception of the science as early as 1911, that is, before the present American proponents of that view had explicitly declared themselves.

"Consciousness," says Professor Singer, "is not something inferred from behavior; it is behavior" (p. 10). From which it follows that the study of mental phenomena means the study of behavior. Unfortunately for us, the discussion and defense of the author's position is directed toward the speculative thinker rather than the experimentalist. He naturally uses the language of the philosophers to combat their traditional conceptions of mind and soul. For the psychologist the book is likely to prove difficult reading and on that account the author's behavioristic views failed to receive due attention in the psychological world when they were first promulgated.

In several other respects Professor Singer maintains an advanced position. He combats the view that experience begins with sensations (p. 85). He asserts that there is "no mind without change of mind" (p. 147). Neither sensations nor sense-qualities are 'immediate' data (p. 178); they are rather the "ending point of our scientific labor" (p. 184). The discussion of mechanism and teleology (chs. X-XII) is of interest to the genetic psychologist. The book is worthy of careful study, especially by those who wish to found their psychological system on a solid, self-consistent basis.

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ROBINSON, E. S., and RICHARDSON-ROBINSON, F., *Readings in General Psychology*. Chicago: University of Chicago Press, 1923. Pp. xvi+674.

It would be extremely interesting a few years from now to have some sort of summary of opinion regarding the success of the

present volume as a text for introductory courses in psychology. One may have at the present time his own opinion as to the feasibility of the book for such a purpose. It remains to be seen, however, what the mature verdict of experience will be.

The very practical and pedagogical purpose for which the book was compiled is admirable. "Our elementary courses contain so many students that library assignments are in many cases all but impossible. In light of this fact, we feel that instructors will welcome a single volume which contains an ample and representative supply of reading materials." The book is also in line with a tendency which is becoming more general in the teaching of introductory psychology in our colleges. There are two opposite extremes which may be adopted in introducing students to psychology. On the one hand the instructor may approach the subject from a single point of view and place primary emphasis on system; on the other hand he may minimize points of view and system in order that a greater mass of factual material from various sources shall be placed before the student. Either procedure, in the extreme, has certain obvious disadvantages. But the disadvantages of the second procedure, especially if it is judiciously modified, are less serious. And it happens to be the procedure which is more widely followed in our introductory courses to-day—and in the opinion of the reviewer, rightly so. Only a very few of the students who enroll in introductory courses ever become psychologists by *Fach*. The majority come to psychology as one among numerous disciplines which have a more or less direct relation to life and which have this relationship as their ultimate sanction. The sanction for dealing with the phenomena of mind in the light of system and logic belongs to the psychologist as scientist. The present volume, then, would seem to be the most admirably suited for use as a text in introductory courses, for it brings together a big supply of material from many quarters and arranges it with some regard for logical order and with the realization ever in mind that the book is intended for students who must learn as they read. Since the book is intended to take the place of assigned readings in the library, the instructor in his lectures could place primary emphasis on system, if he so chose. He could even use the readings in the book as an example of the lack of system in much of current psychology.

The book is divided into twenty-two chapters which range from introductory readings on the problems of psychology, through sections on the nervous system, typical forms of behavior, sensation,

attention, perception, higher thought processes, feeling, emotion, and action, to concluding chapters on personality, individual differences, work, rest, and sleep. Since the selections are from many different authors, the instructor could probably rearrange the assignment of readings into a different order to suit his own particular method of presentation without introducing confusion. If he is trying to place some emphasis on system he will want particularly to change the order of presentation in certain places, *e.g.*, where readings on musical intervals and temperament, consonance and dissonance, and melody are included under auditory sensation rather than in the chapter on perception, and where the treatment of feeling follows the chapters on higher mental processes.

The authors have selected over 200 readings for the content of their book from over 100 different writers. There are seven selections from Watson; six each from Angell, Dunlap, McKendrick and Snodgrass, Stiles, Thorndike, and Titchener; and five from Ebbinghaus, James, Judd, Pillsbury, Ribot, and Sully. The book is provided here and there with exercises for the students which consist generally of questions or topics for discussion. Well documented indexes of subjects and names come at the end of the work.

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SCHILDER, P. *Medizinische Psychologie für Ärzte und Psychologen*. Berlin: Springer, 1924. Pp. xix+355.

Apart from the fact that the author is a physician there appears no good reason why this book goes under the title of a "medical" psychology. It reminds one in this respect of Lotze's "medical psychology" published more than fifty years ago. The book is written in a very readable style, contrary to the reputation, often well deserved, of books written in the German language. And it is well printed. The contents give the reviewer the impression that the author for many years has made it his hobby to collect quotations of authors on psychology, psychoanalysis, brain anatomy and related fields, for the purpose of publishing an encyclopedic dictionary of psychology for the use of physicians; and that he then changed his mind, renounced the alphabetical arrangement, rearranged the collected matter logically and published it as a psychology book. It is systematic only in the sense of having all the collected matter logically arranged. It is not systematic in the sense of being pervaded by any, even approximately original, constructive idea of the author. Any

one of the more typical pages tells us what five or six different people have "opined" (rather than what the author himself "concludes") about the matter which happens to be discussed on the page. There is a bibliography of 300 or 400 titles, the vast majority referring to German publications, very few to French ones and hardly any in any other language.

After an introductory chapter the succeeding chapters inclose in neat orderliness the material on (II) Sense Perceptions, (III) Voluntary and Other Actions, including speech and aphasia, etc., (IV) Memory, including practice, (V) Sexual and other Instincts, a discussion of 120 pages dominated by Freudian influences, (VI) Personality, (VII) Affective Experiences (including erotics, sociality, neuroses, religion, esthetics and suggestive therapy. The author tells us in the preface that the book is not written for the ordinary "student" in the sense of a person who desires to learn something new and unfamiliar—that only he who already knows a good deal about these things can profitably use the book. That is true.

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GEMELLI, AGOSTINO. *Nuovi Orizzonti della Psicologia Sperimentale*. Milano, Società Vita e Pensiero. Pp. xiv+387.

This book, in second edition, revised and augmented, but undated, is dedicated to F. Kiesow "in spite of differences on particular questions." It consists of three main parts, in the reviewer's judgment. For 125 pages the author gives us one of the traditional histories of the "experimental psychology" of the nineteenth century, raising the curtain before such familiar names as Fechner, Lotze, Helmholtz and, of course and especially, Wundt. Many pages are devoted to discussing the proper place for psychology within philosophy and for philosophy within psychology. Very little good is expected by the author from the intrusion of biologists into the field of psychology. "Biologists will never explain the existence of consciousness," he tells us (as if that were what the biological psychologists were trying to accomplish!). A warning against emphasizing evolution and against the "materialistic" implications of this doctrine is not lacking.

For 147 further pages we are then given a rather good report of the methods used by the "Würzburg school" for the investigation of the "thought processes." This gives the author a chance to mention the name of an American psychology professor, Titchener.

Otherwise American psychology is not much mentioned, aside from the statement that psychological laboratories in that country are numerous and well equipped. Then follows a kind of interlude of 24 pages, treating of the pathological method in psychology. It follows the lines of discussion between psychiatrists and psychologists to which we were accustomed twenty or more years ago. The reviewer feels uncertain as to whether he ought to praise or blame the author for saying nothing of psychoanalysis.

The last 81 pages the author devotes to an "examination of a notion fundamental for psychology," to the problem of the possibility of a science of conscious phenomena. He has already told us in the preface that "psychology is of course a science *sui generis*." We now learn about the limitations of consciousness, the degrees of consciousness, the unity of consciousness, the threshold and the conditions of consciousness. If this is a typical textbook in Italy, the reader has to conclude that psychology in Italy has not changed very much during the last twenty-five years. However, we still print a few such books in America, too.

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AHLENSTIEL, H. Ueber die Stellung der Psychologie im Stammbaum der Wissenschaften und die Dimension ihrer Grundbegriffe. *Bonnhoeffer's Abhandlungen aus der Neurologie, etc.* Heft 23. Berlin, Karger, 1923. Pp. 58.

This article is essentially a discussion of the proper definition of the science of psychology. The author adopts the same definition which the reviewer for several years has adopted in his own publications. The reviewer does not say this in order to suggest that the author has copied it from him, but in order to indicate that this is perhaps the reason why the reviewer thinks that this is perhaps the sanest discussion which anyone ever published on the definition of psychology. The author absolutely rejects all definitions of psychology as the science of "inner, spiritual" experience, for the good and sufficient reason that this is entirely contrary to the conversational usage of all the modern languages. In conversational language psychological or mental means nothing of the sort, but means those events of human life which are characterized by the plasticity which a human being's behavior shows in relation to and in the midst of other human beings. In short, what is meant is life in so far as

it has a social significance. It is a pity that the author is not acquainted with the definition which some American psychologists have adopted in recent years, saying that physiology studies the animal in pieces (what a poor physiology that would be!) and psychology studies it as a whole (as if a psychologist were enjoined from studying a single eyeball!). The author would certainly have enjoyed rejecting such a ridiculous distinction. He holds that psychology studies what physiology studies and with the same means, but that the psychologist generally prefers to pick out those phases of life which have social significance. The same view is held in America also by A. P. Weiss.

In a rather important appendix the author defends his point of view against certain enemies of a psychology which defines itself as "socio-biology." These enemies are apt to harp on the unwillingness of any psychologist to undertake to predict in minute detail of anatomical structure and physiological function a human being's future. The author rightly points out that if any small or large body of geologists would devote themselves to studying in minute detail the crystals making up a granite mountain and to foretell all the changes which might occur in all of them in the future, this body of geologists would be adjudged insane. The fact that they are too sane to do that is no argument proving that geology is not a science based on physics and chemistry, but must be a "spiritual" science.

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GUSTAV KAFKA (Editor). *Handbuch der Vergleichenden Psychologie*. München, E. Reinhardt, 1922. Band I: Die Entwicklungsstufen des Seelenlebens, pp. 526. Band II: Die Funktionen des Normalen Seelenlebens, pp. 513. Band III: Die Funktionen des Abnormen Seelenlebens, pp. 515.

This is quite a remarkable enterprise, well done by twelve different authors. The first division is Animal Psychology by the editor, Gustav Kafka. The American literature on this subject is given an unusually complete consideration. Comparative Psychology is characterized by the editor and author of this division as mainly "biological," but is immediately and in the same sentence defined also as "the relations existing between the different rôles played by the different divisions of the life of the soul." Of "consciousness"

the author says that it is the psychical correlate of the reaction to stimulation. But no attempt is made to state definitely what the nature of this "correlation" is. And while he prefers anatomical and physiological discussions to mere speculations about "consciousness," as soon as he has exhausted his biological resources, he is far from being inclined to adopt the custom of the physical sciences and continue in *material hypotheses*; without saying a word about the abrupt change of the matter, he continues the discussion in terms of consciousness, quite in accordance with the tradition of orthodox psychologists. It is quite natural, therefore, that we should see him state that *his* only reason, why he does not include the life of the *plant* soul, why he limits himself to the animal soul, is the fortuitous circumstance that about the life of the *plant consciousness not enough has hitherto* been discovered. As the reader will notice, there is nothing "behavioristic" in this treatment, a fact which will please some, displease others. He expects a plant psychology in terms of consciousness.

About "nerve centers" the usual assumptions are made about their *spontaneity* of function, though the nature of this function is left entirely *undefined*. "Intracentral" activities are used as factors of explanation. But since most psychologists expect nothing else, they will be satisfied with these "intracentral" activities, mythological though they are.

The more complex actions of an animal can be understood, as the author asserts, "at the present date only teleologically." The term reflex is used for objective, that is, causal, explanations. The term instinct is used for the teleological explanations. Whereas all the other sciences have expelled teleological explanations from their realm, some psychologists, as we see, still accept them quite naïvely. The concept of an instinct as a convenient term for any one of the more *complex reflexes* is quite unacceptable to Kafka.

Thirty-seven pages are devoted to a comparative discussion of the sense organs (all kinds of them) of both the vertebrates and the invertebrates. Considering its briefness, it is a rather good compilation of the essential anatomical facts. Eight further pages are devoted to spatial perceptions, four pages to temporal perceptions. Almost nothing, however, is said about temporal perceptions except what falls under seasonal and daily "periodicity."

A dozen pages are devoted to the discussion of mechanistic hypotheses concerning the nervous processes underlying "learning by experience" or "association" (the traditional term of philo-

sophical psychology). The reviewer notices with pleasure that the author rejects "psychoïd" factors as introduced by speculatively inclined biologists like Driesch; and he also notices with pleasure that the author asserts the absolute necessity of making "hypotheses" in order to understand "learning by experience" as an objective nervous process. On the other hand the reviewer notices with regret that the author is entirely unfamiliar with those diagrams of the hypothetical nervous paths which the reviewer has developed for more than fifteen years and which are decidedly superior to the diagrams, far too simple, used by the author for the construction of his "hypotheses." If the author had made himself familiar with the reviewer's "Psychology of the Other-One," he would have found that it is not necessary to assume a shuttle motion (Hin- und herfliessen) of the nervous excitation in any neuron, nor to assume simultaneity of the two essential nervous processes, in order to understand "learning by experience" as a nervous process. He might have found some further suggestions in the reviewer's Manual of Psychology Demonstrations if the latter book had not been published too recently. The author, nevertheless, deserves much praise for seeing that there is here, in "learning by experience," a problem which must be solved by neurological hypotheses, instead of being pushed aside by such meaningless phrases as "stamping in by pleasure," or by other "psychoïd" assumptions.

One soon is disappointed again, however, when he reads the enthusiasm with which the author suddenly falls back upon such "psychoïd" explanations as the "Aha-Erlebnis." The reviewer knows too much German to find it easy to translate this phrase into English except by means of a slang phrase or one of the tame oaths of popular language. One might translate it by "the b'gosh-experience." But the reviewer can not see how anything can be "scientifically" explained by assuming a miraculous effect of such an "introspective" or, as we quoted above, "psychoïd" factor.

In a continuation of the discussion of the learning process under the title "learning by trial and error" the author expresses the opinion that these two cases must be strictly distinguished: when the *stimulus belonging originally* to the "learned" response is the *first* of the two essential stimuli, and when it is the *second* of the two stimuli essential for the learning process. In the former case, the author teaches us on page 99, we have no real right to speak of "learning" or "association." It is mere "perseverationstendenz." The reviewer however, using his own methods of representing in a

clear diagram the nervous paths concerned and leaving out of consideration "muscular fatigue and muscular practice" as something that does not belong to the nervous function, does not see any essential difference between the two cases. Maybe the author would reach the same conviction if he would represent the nervous paths in question diagrammatically and were willing to cease to explain animal action by reference to such mysterious entities as "Gestaltqualitäten" in the animal's "consciousness."

The second division of the first volume is entitled *Psychology of Primitive Man*. The author is Richard Thurnwald. "Man was the first domesticated animal." But while animals adapt themselves physiologically, Man does so psychologically. In the same paragraph, however, the author explains what he means by "psychologically." Man profits more by the possession of his brain than animals do by the possession of their brains. Is a brain nothing physiological?

The evolution of a society's culture depends, the author tells us, on five classes of factors. (1) Universal physiological conditions of the human race. (2) Geographical conditions. (3) Inbreeding within particularly located tribes or nations. (4) Individual mutations producing leaders of society. (5) Imitation of the customs of other tribes.

The author warns against overemphasis of differences in the gross anatomy between the primitive and the modern man. The author, quoting much from the literature, also warns against any belief that a difference in the physiological functioning of the nervous system and of the sense organs between primitive and modern man has been clearly established.

The members of the human race have always lived in societies. Gradually a differentiation of social classes was produced by factors greatly varying among different tribes. Originally there is no distinction between political and family organization. Later this distinction becomes absolute. Robbery and slavery place the females on a lower level within the society. Simultaneously a differentiation produces the type of the woman of high social level, the "matron."

Technical development depends largely on geographical conditions. For example, the bow and arrow is used in very primitive societies where elastic wood is plentiful, but is not used by the Egyptian soldier who can not easily obtain such raw material. Clothing originally serves only the need of protection. In later

societies a great variety of rules is found demanding that this or that region of the body be covered.

We place the thread into the eye of the needle, says the author, whereas the Chinese and Japanese hang the needle on the end of the thread. The reviewer has seen the latter done by American seamstresses who surely did not learn it from Asiatics. Do such distinctions really help us to gain a scientific understanding of human life? The reviewer can not help feeling that most of the facts of this anthropological science are nothing but anecdotes and curiosities, are not facts of a real science. But in asserting that, he does not wish to blame the author. It all depends on one's definition of "science."

The early use of bronze is merely the result of the lack of a metallurgical process by which copper could be obtained pure.

Under Art are discussed dancing, music, representative art, ornamentative art, poetry (love songs are rare!), mimetic art. The spoken drama is not found among the primitives.

The various kinds of primitive "script" (including, for example, the Peruvian quippu) are well discussed.

Concerning the origin of language the author holds that the first words were signals of action. The reviewer agrees.

Primitive man is strongly disinclined to use abstract numbers. Instead of saying "three men" he will rather say "a tall man, a longnosed man and a redfaced man." A swineherd refused to count beyond eighty, saying that no tribe possessed more than eighty swine.

Three classes of ghosts play a rôle in primitive religion: the ghosts of *Natural Objects and Natural Forces*, the ghosts of the *Dead*, the ghosts believed to be the *Creators* of the world, of plants, of technical devices, etc.

The article contains a large number of good illustrations and a bibliography of 320 titles.

Fritz Giese is the author of the third division of the first volume, "Child Psychology." The article is a very readable presentation of the material collected by the workers in this field in Germany. But the literature published in the English language seems to be known only through secondary sources. The reader is asked to get his information concerning the English sources by looking for them in Wundt's "Physiologische Psychologie" and in Meumann's "Einführung in die experimentelle Pädagogik." Nevertheless the reader will be well repaid by seeing what German authors have discovered in more recent years.

Giese is much impressed with the limitations of "paper and

pencil" tests and gives illustrations of apparatus designed for the measurement of special abilities. Most of the measuring apparatus shown is rather primitive. Some, however, is quite ingenious, keeping the test record automatically, and imitating the conditions of life where the task itself is the stimulus calling for its continuation (instead of requiring for each little act an arbitrary stimulus as in the reaction time measurement). It is to be regretted that the author has not devoted much more space to this "Methodik."

The author then discusses bodily heredity in the Mendelian sense. A very good table shows the development of the psychologically interesting functions from birth to the fifth year. The different forms of play in different years and under different surroundings are interestingly described. The differences between the sexes during adolescence are very well described. The influence of country life, the small town and the metropolis is discussed.

Among other periodicities the theory of Fliess, who teaches a twenty-three days period in the human male as corresponding to the twenty-eight days period of the female, is mentioned, but not accepted with finality. There is a very interesting comparison between the factors determining the activities of the child and those determining the activities of the adult.

The whole article is divided into two parts. General Child Psychology and Pedagogical Psychology. The second part emphatically warns against the error, common in the pedagogical literature of the eighteenth and nineteenth century, of regarding the child merely as an adult not yet complete. The psychology of the child is wholly different from that of the adult. And again the psychology of the children of different nations, and of the city on the one hand, of the country on the other, reveals great differences which are not reducible to mere degrees. The author quotes many significant "literary" contributions of boys and girls of different ages, illustrating their manner of thinking. There is a brief, but no less valuable summary of the various factors establishing a favorable or unfavorable relation between the pupil and the subject taught, and between the pupil and the teacher.

The discussion of intelligence tests and special ability tests is one than which nothing better can be found in the American educational literature. Among many other facts the mistakes are clearly brought out which result from overlooking merely temporary influences of sex development. For example, in both sexes early literary activity may result from the advent of puberty and may not be last-

ing. In the female sex apparent great talents may be almost completely volatilized by or after marriage. This is often true even where marriage does not lead to motherhood. For the male sex the greatest danger to a great talent lies in the narrowing influence of the choice of a definite vocation.

The abnormal psychology of childhood is treated only briefly. In Germany the war has had even more disastrous consequences for children than for grown people. Many examples are cited. Very important are the comparisons made by the author of the various phases of development in the child separate from others and in the child as a member of a larger and smaller group of children. This involves problems of much importance in educational administration and in the methods of teaching.

Readers of other than German nationality will notice with much satisfaction the very sane attitude assumed by the author in his discussion of child psychology with reference to the late war.

Giese's "Child Psychology" deserves to be called an unusually valuable contribution to the literature of psychology.

The second volume begins with a psychology of Speech by H. Gutzmann. The author discusses first the perception of speech by the auditory, the visual, the tactual-kinesthetic sense. He emphasizes that the auditory perception is exceedingly unreliable except when it is aided by the *expectation* of the hearer *knowing* the language, *knowing* the linguistic context, and *knowing* by sight the intention of the speaker. When we realize this, we no longer are astonished by the fact that some deaf individuals are extraordinarily capable of understanding a speaker by so-called "lip-reading." The person who is deprived of the three aids above mentioned and is forced to perceive, say, non-sense syllables by plain hearing, is as little capable of accomplishing this as he is of perceiving by lip-reading. "Lip-reading" is really a wrong, that is, too simple, term. Visual perception of speech is based on making *three* kinds of observations, on the fore and back movements of the *jaw*, on the up and down movements of the *bottom of the mouth*, and on the shaping of the *lips and cheeks* combined. Of the perception of one's own speech by tactual-kinesthetic sensations one can get a good idea by observing with which accuracy, as the author points out, one can give the mouth that shape which is necessary to produce a particular tone desired in whistling.

Speech production is discussed by the author in a double sense, as the production of speech gestures and of speech sounds. The author

gives interesting directions as to how to proceed in the systematic building up of a language expressed in gestures. The remainder of the article is devoted to aphasia, apraxia, agnosia and the like.

G. Runze treats the psychology of Religion. He tells us that, on account of the limited space, he does not intend to give us a systematic treatment of the psychology of religion. He wants to restrict himself to a statement of the value, the scope and the method of such a study. He defines the main problem as follows: "How does religion originate—in primitive times, now, and in all times to come?" and calls it a psycho-biologic-genetic problem. As "typical" theories of the origin of religion he enumerates the following: Totemism, animism, tabuism, manism, nominism; in addition there are mixed theories. The social significance and dependence of religion is emphasized. The following sources of religion are specially discussed: (1) Desire and fear; (2) dream and fantasy; (3) the puzzled intellect; (4) ethical motives; (5) the ideal of an ethically perfect human being; (6) language, through the suggestiveness of words. All of these are recognized, and language is given an especially important place. But the reader is warned against regarding language as the only source.

The psychology of the fine arts is discussed by Richard Müller-Freienfels on 154 pages. The author begins with an attempt at making a distinction between esthetics and the psychology of art. But three pages later he admits that the only possibility of defining the psychology of art is found in the description of the esthetic experience. Unfortunately he finds no other way of defining the esthetic experience but by calling it that experience which is accompanied by a feeling of pleasure. Is it really possible to hold that all practical, non-esthetic experiences are devoid of pleasure? The author points out that the experimental method of the psychologist as applied to art has much more as its object the discovery of individual differences than the discovery of esthetic laws to which all individuals are subject. Individual differences should certainly not be overlooked, but the reviewer does not see why a psychology of art could not be made much clearer if based on a single principle. The reviewer would choose as such a principle the biological fact of play. Others have chosen different principles, for example, the somewhat metaphysical principle of "Einfühlung." The author prefers a decided eclecticism, collecting and presenting to the reader all esthetic principles which can be found anywhere in the existing literature.

The whole treatise is divided into two parts, the first devoted to

the "music" (not merely musical) arts; the second devoted to the representative arts. The author tells us that in the beginning there was an undifferentiated "musische Urkunst" which included dancing, music, and linguistic expression, unseparated. Out of this undifferentiated music art develop the differentiated arts of music, dancing, the dramatic and the poetic arts. Wagner's attempt to fuse these arts is, then, obviously contrary to the trend of evolution.

While the reviewer does not approve of the author's eclecticism, this must be said in its favor, that it has kept the author from falling into the error, so common among estheticians, that formal laws, once discovered in one of the arts, can without hesitation be transferred to all the others without further necessity for discovering what the laws of the other arts are. One need only remember the incredible nonsense that has been written about color harmony in consequence of expecting to find in colors the esthetic laws of tones. The author keeps entirely free of such mistakes.

It is the tendency among psychologists to regard every kind of dance as being of the nature of a dramatic performance. Our author is led by his eclecticism to distinguish two kinds of dance, the dramatic dance, and, in addition, the "Rauschtanz." The latter is supposed to be purely emotional, undramatic. The dance of the oriental dervishes is given as an example. But the reviewer sees in the dance of the dervish the performance of self-sacrifice, something decidedly dramatic.

In his treatment of the art of music the author rightly points out how much conventionality there is in it. The case of music is similar to that of the linguistic representation of the cock's song, which in German is "Kikeriki," in French "cocorico," in English "cock-a-doodle-doo," in Chinese "kiao-kiao."

The representative arts are treated under four headings: decorative art, architecture, sculpture, and drawing and painting. He points out, quite rightly, that the decorative arts cannot be derived from a "pure need of decoration." Many personal ornaments, for example, were at first amulets, protecting the owner. The reviewer is astonished to find that the author even assumes the existence of such a factor as the "need of decoration" serving no practical purposes whatsoever. To the reviewer all the arts are biologically useful acts, playfully performed.

In discussing sculpture he tries to establish a contrast between Hildebrand and Rodin, trying to create in the reader the idea that in the opinion of Rodin the highest esthetic appreciation of sculpture

depends on viewing the sculpture from as many different directions as possible, whereas Hildebrand emphasizes the importance of finding and using the main point of view. The reviewer believes that the author has misunderstood Rodin, and that the apparent difference of opinion is due only to an unfortunate choice of terminology employed by Rodin and his interviewer, Gsell. The reviewer believes that Hildebrand and Rodin, and also Michael-Angelo, who, too, is placed in contrast to Hildebrand by the author, agree perfectly.

Many interesting facts are collected, showing to what enormous extent the spatial values of colors and of linear perspective are conventional, and therefore variable from time to time and from nation to nation.

The author ends, in his résumé, by asserting that, after all, the arts are a unit, have something in common. But he does not dare say clearly what this is that they have in common. He merely hints at various possibilities. Maybe he was wise: he certainly cannot be accused of dogmatism. And the reader who desires a first introduction into the field of "esthetics," if he does not mind the lack of a unitary principle pervading the whole treatment, will find here a wealth of material in comparatively little space.

Aloys Fischer treats the Psychology of Society on 118 pages. He makes (tries to make) a distinction between social relations (that is, instincts and other actions of social effectiveness) which are called social *merely* because they have such an effect, and those which are called social because they *really are* (p. 340) social. The reviewer records the distinction without admitting that he is able to understand it. The author reminds us that "society is a psychic structure and therefore takes the existence of other psychic beings for granted, leaving it to the epistemologist to decide whether such a belief is justified or illusory." The reviewer cannot follow him in taking this for granted, but holds on the contrary that the problems of social psychology exist no matter how indifferent we are with respect to the question whether other *psychic* beings exist or not—that these problems are all positivistic problems. As a matter of fact the author states that social intercourse has three great forms, information, command and suggestion, and illustrates them steadily by positivistic examples like this, that a German aristocrat in the Baltic provinces found it difficult to "preserve the polite forms of treatment" when approaching an educated neighbor who was heard to speak with a slightly non-German accent. What is *psychic* in an objective fact like this example? Is it not an objective fact, which can be witnessed?

"Milieu, tradition and organization" are discussed in the third chapter of Fischer's treatise, government, leadership and representation in the fourth, castes and social classes in the fifth, the social mass (or mob) in the sixth. He points out that a group is not always and necessarily inferior in intelligence to each of its members, that it is an important problem to find the conditions under which the contrary is true. The superior work of pupils working in school under supervision, in comparison with individual work, is given as one of several instances.

The interactions between the individual and the various groups to which he belongs are exemplified in the seventh chapter. Family, club, professional association are among these examples. The smaller the group, the more despotic it is. A group may take the place of another individual, for example, the "country" may replace wife, child or friend to him who has no wife, child or friend. The eighth chapter discusses the evolution of sociality in childhood. An important distinction is made between unsocial and antisocial. Egotism is not unsocial.

Otto Lipmann writes on the Psychology of the Vocations on 52 pages. He asserts that there are two such sciences possible, one being a psychology of the individual, the other a differential psychology. The reviewer can not admit this. A description of one individual without reference to others may be a piece of literature, a biography or a novel. But science? No. The reviewer believes that "individual psychology" is a misnomer, a badly chosen synonym for the far better term "differential psychology."

The author reports that he attempted ten years ago to write a psychology of the vocations based on answers to a questionnaire. He received a few interesting replies which he copies, but on the whole expresses himself pessimistically about this possibility.

He then enters into an analytic discussion of the vocational activities. He distinguishes three classes of vocations, the artistic, the academic and the "middle" vocations. The latter signify trades and commerce. "Middle" is certainly not a psychological term, but merely a term expressing the social bias (even after the revolution!) of a German university man. Over a hundred "abilities" which may play a rôle in the various vocations are enumerated. Their very number proves that they are a mixture of psychological qualities, such as quick reaction to temperature conditions, and names of trade tests such as "the rediscovery of a first-luminous and then disappearing point by groping, when the groping movements are not to be seen, and

with reference to particular spatial relations." Such a complex test does not seem to the reviewer to have much value in a "psychology" of the vocations, no matter how useful a trade test it may be in one particular kind of factory work. The author seems to see the point himself and distinguishes from a "vocational psychography" something more scientific—pure science—which he calls "Berufssystematik," and which the reviewer would translate as "the true psychology of the vocations." But here again the social bias of the author gets the better of his scientific disinterestedness and he divides the vocations into "higher, middle and lower ones." He tries hard, nevertheless, to free himself of the dominating notion of social castes. He does it by asserting, without the least proof, that the qualitative *differences* of performances of *individuals* in the "lower" vocations are "without doubt less numerous" than in the "higher" vocations. To an American, not accustomed to an arbitrary caste system, such an assertion will doubtless appear somewhat doubtful, and requiring psychological analysis, counting of the differences of performance and statistical inquiry before it is accepted. To the reviewer it appears possible that it is an illusion due to the fact that the *name of an individual* engaged in sweeping chimneys is less likely to be recorded in an *historical record* of any kind than the name of a professional man. But a professional man may be a "routinier," and a chimney sweep may be a genius, although the latter in this case would probably after a while come to hire machines (of metal or flesh) to do most of his work.

Lipmann then divides the "higher" vocations into such as make use of symbols, as make use of much memory material, as require technical experience. Why did he not avoid the term "higher" altogether and simply say that a certain vocation requires much memory material, a certain vocation requires much symbolizing, etc.? A psychologist ought to abstain from social-historical evaluations. There was a time when the highest vocation was that of a warrior. The author copies various attempts of various authors to classify the special abilities of man in order to distribute them as more or less requisite over the various vocations existing, including the "middle" vocations. "Inborn" special abilities are called by him "formal" abilities, whereas "acquired" abilities are called by him abilities "of content," "inhaltliche Fertigkeiten." The list of these abilities does not seem to the reviewer nearly as good as that found in Hepner's "Manual for Vocational Success." Lipmann's article contains, of course, a large number of valuable observations and quota-

tions referring too much to details to be included in a review, for example, the fact that of 35 students in a teacher training school in Belgium, asked for the reason for being there, not one stated that he had a particular ability or inclination for the vocation of teaching, though many other motives were recorded.

Hans W. Gruhle is the author of the division entitled "The Psychology of Abnormality." His task is a difficult one, since he is expected to avoid encroaching upon criminal psychology, sleep and dreams, or sex, fields which are treated by different authors. And he has decided to avoid also whatever is usually regarded as "psychiatric." That he nevertheless for nearly 150 pages presents a well ordered amount of material which makes interesting reading, is greatly to the credit of the author. Nevertheless, the reviewer cannot suppress his doubt whether science is really served by the effort spent on publishing such a collection of "psychical abnormalities." The abnormalities appear in this treatise in five main groups: (1) Exaggerated and diminutive sense impressions and images; (2) exaggerated and diminutive willing and feeling; (3) acts of normal intent, but abnormal execution; (4) acts of abnormal intent, but normal execution; (5) acts abnormal in both respects. The author himself states that he is not satisfied with this classification, but that he knows no better one.

As subdivisions under (1) are described typical hallucinations, agnosias, aphasias, apraxias. As subdivisions under (2) appear mania, depression, stupor, anxiety, etc. Then follow 60 pages under the title "Abnormalities of Quality," the material of which, so far as the reviewer can see, might just as well have been distributed under the items 3, 4, and 5, if the *logical* insufficiency of these hallucinations, ecstasies, automatisms appeared predominant, under 1 and 2 if their lack of harmony with the more ordinary sense experiences was to be emphasized. For example, there appears in these pages (p. 49) a table of the "foolish" (paranoic) names given by a patient to his "hallucinations." In reading the treatise one has the same impression as that on visiting a large insane asylum and being guided through it by a friend who tries to let the visitor observe as many varieties of folly as possible, following for this purpose a definite plan, but a plan which might have been quite different and would have served its purpose just as well, the purpose of satisfying our curiosity.

M. H. Goering undertakes to give us a psychology of the criminal. He does not intend to include in his treatise the psychology of testi-

mony, or the psychology of the judge. The treatise is divided into five parts, (1) the development of the criminal, (2) the criminal before the act, (3) the criminal act, (4) the criminal after the act, (5) the criminal after the commitment to a penal institution. The influence of race, family, age, sex, intoxication, climate, social surroundings and even internal secretions upon the criminal's development are well presented. However, the author seems to go too far in expecting that our increasing knowledge of the physiological effects of internal secretions might throw a new light upon the development stages of criminals. The details of the treatment of the other four chapters make very interesting reading, but cannot be enumerated in this review.

Sante de Sanctis published a book on dreams more than thirty years ago. In writing on the *Psychology of the Dream* for this collection he takes good care of the many contributions, direct and indirect, which have been made during these years by many workers in the field of physiology, psychology and medicine. He first discusses the physiological conditions of the dream, including a statement of the many and very different theories of sleep and of the distinction between the sleeping life and the waking life. Proper attention is given to the various postures of sleep, as revealed by direct observation and by the representations in the arts of the sculptor and painter.

A second chapter treats of the structure and dynamics of the dream. He gives many examples and quotations pointing out how prevalent visual elements are over all others in dreams. Statistical data show that the data which appear in the dream may be experiences of the moment (during the dream) or of days ago or of years ago or so-called "unconscious" memories. A great deal is said about the metamorphosis of experiences into those of a different kind or of different emotional significance. The third chapter is devoted to a discussion of theories of dreaming, giving, naturally, a good deal of attention to the doctrines of Freud, accepting some but rejecting the most typical ones. The author's own theory, very clear and entirely acceptable to the reviewer, makes one wonder why the third volume of the *Handbuch*, of which this treatise is a part, appears under the title "*The Functions of the Abnormal Life of the Soul*." Sante de Sanctis holds that the Ego of the sleeping is the same as that of the waking individual; merely the peculiar conditions in which the sleeping person exists contribute toward making his experiences strange, often illogical, different from those while he is awake, but not

abnormal. That in certain mental diseases similarly strange experiences occur, does not make those of the dream abnormal. The dream is merely an analogy to the abnormal, but itself normal.

If the reader wonders why dreams were classified by the editor under the abnormal life of the soul, he still more wonders why "The Psychology of the Sexual Life," by Rudolph Allers, is thus classified. Was it necessary to have any title unifying the contents of the third volume in this illogical manner? Allers quite rightly describes the sexual life as an important phase of the life of every normal person. He has also a chapter on deviations from the normal functions, but how absurd it is to look upon this chapter as describing "the abnormalities of the abnormal."

The larger, but hardly most valuable part of this psychology of the sexual life consists of a vast and well ordered collection of varied relations capable of existing between individuals of different sex, from childhood to old age. These samples might have been taken from the biographical and novelistic literature and might now serve as a source book for novelists seeking for possible events to motivate their plots. As an example of the literary and figurative rather than scientific character of the collection just one quotation (p. 397): "Woman, herein differing from man, never yields herself as a complete individuality, to be owned by the other one without a remainder." If that is not a figure of speech, a poet's expression, then what is a figure of speech? The reviewer, who in his early years received his "scientific" training from teachers of mathematics, physics and physiology, cannot detect in that quotation any "scientific" meaning. The author himself—the reviewer does not understand why—repeatedly says that his task "must" be a descriptive, not an explanatory one. However, even this part of the author's treatise is very sound in this respect, that he is open-minded, entirely undogmatic, not preferring anything sensational, and constantly emphasizes, while this and that *can be so* in some individuals, that *in others it can be different*.

In a truly scientific sense the valuable chapters of the treatise seem to the reviewer the three entitled "Erotic Types," "Deviations" from the simple biological norm, and "Love" in its varied meanings. Here the author assumes, perhaps without knowing it, the attitude of the scientist seeking explanations, relations of cause and effect clearly defined. Under types are discussed the ascetic, the seducer, the prude hypocrite, the bachelor, the spinster, the seemingly sexless, the prostitute herself, her protector and her customer. The

homosexual, the narcissist, the fetichist are placed in the chapter on deviations. To the reviewer such a division does not seem scientifically justifiable, but, of course, chapters must not be out of proportion in length. The author very wisely shows little favor to explanations based on heredity, but makes it very clear that all these variations can be fairly understood on the basis of variations in the earlier experiences of individual lives. Quite consistently he objects to giving any common deviations from the most ordinary behavior the name of "signs of degeneration." He gives due consideration to the facts which Freud and to a lesser extent his followers have placed in the light, but he rejects the explanatory theories of Freud and the Freudians as being both deficient in logic and superfluous. His chapter on love makes clear that the fact that various kinds of love (marital, maternal, patriotic, etc.) may coexist and even support each other, does not prove their genetic identity. The last chapter on "Transformations of Sexuality" is only a further elaboration of the view expressed in the chapter on "Love" and rejects especially the conclusions which so often are drawn from the assumption of "a definite quantity of libidinal energy" and all kinds of "transformations" thereof. To the reviewer the whole treatise appears especially commendable because it is one of the few in existence which consider virtually all the manifold phases of the sexual life as essentially normal phenomena, which, while not occurring in everyone's life, might be expected, under particular circumstances, in any individual.

MAX F. MEYER

W. B. PILLSBURY. *Education as the Psychologist Sees It*. New York: Macmillan, 1925. Pp. ix+342.

This is a general text written to interest "the teacher as well as the student" but it is presupposed that the teacher will have a fundamental knowledge of psychology. "It attempts to consider the problems of the teacher as they are presented to the psychologist." Hence "the book aims to indicate what we should expect the process of education to do for the child." This implies (1) a knowledge of the nature of the child before education; (2) a study of the psychological processes involved in working the changes required; and (3) "a summary of the methods that have been developed for the measurements of the progress that has been made in each of the school subjects."

After a general discussion of the relation of the psychologist to education, the author considers, in a chapter, the meaning of statisti-

cal values—emphasizing distribution curves and correlation coefficients. Then, naturally follows the discussion of the original nature of the child, with special emphasis on the matter of individual differences. The nature of intelligence tests and their results indicate these differences very clearly to the reader. "Intelligence" is the capacity tested and this Pillsbury "roughly" defines as "the capacity for success in school and in life, so far as that depends upon the mere ability to acquire and use knowledge."

The causes of the differences in children are then discussed and both the environmental and the latent tendencies views are presented. But, following Thorndike's study of twins, Pillsbury concludes that the major part of the differences may be placed on a hereditary basis. The work of Pearson, Goddard and others is marshalled to substantiate this conclusion. Then follows a discussion of the general characteristics of man. Reflexes and instincts are first treated. For education "we must work with the instincts and not against them." Indeed Pillsbury doubts our ability to change instincts in many cases. Certain of the instincts, especially important for education, are given a more extended treatment (constructiveness, collecting, pugnacity, etc.) "Instincts, however, are modified by habits and by other acquired responses and knowledge"—and social pressure (either approval or disapproval) may be important factors in such a modification.

On this basis, Pillsbury then considers the problem of the ends of education. First of all this is the problem of acquiring facts. "In popular terms . . . education is expected to give the individual who is submitted to the process a certain amount of knowledge, the knowledge and specific skill that is required for earning a living and for maintaining himself in that station that his parents have attained." Such knowledge is largely specific and Pillsbury doubts whether the acquisition of such knowledge leads to a general increase in capacity.

Then follows a discussion of the place of habit in learning, in which habit is conceived as the final stage in all real learning. The neurological basis of habit is considered with great clearness of text and is attributed to changes in synaptic connections. The chance basis of the acquisition of habits and the trial and error basis for learning are illustrated by a consideration of speech and writing habits. But "habit in the more intellectual activities is almost as important as in the mere movements." The practical applications of habit to education and some of the neglected phases of habit formation are treated.

In Chapter 8, Pillsbury gives an extended treatment of attention

in education. Attention is synonymous with selection and selection is to be considered of a not much lower degree than creation. The psychological facts of attention are clearly set forth. The practical implications of these psychological facts for education are clearly given in a rather extended treatment.

In the next chapter are considered the general laws of learning and of the art of study. "The psychologist has perhaps more to say concerning the best methods of studying than about any of the other functions of the teaching and learning process." Retention is first considered from the point of view of its neurological basis. The relation of perseveration and association leads to a consideration of errors of recall. Then follow clear but brief discussions of the different general psychological laws of learning. In each case, the practical aspects are noted, *e.g.*, cramming is considered under divided repetitions, etc. Recall is due to association and is determined largely by attitude as well. Verbal and sensory learning are contrasted. Recognition is separately treated. Some ten practical rules for studying summarize this part of the chapter.

In the next chapter the special laws of perceiving, reading and teaching to read are treated. This leads to a treatment of the concept and of the development of concepts. Then, in the next chapter, the problem of abstract reasoning and teaching to think are treated. Reasoning is always problem solving. Pillsbury takes the view that reasoning may be either motor or mental—in either case the movement or the ideas follow the same laws. "Obviously training to think is only possible through the development of habits in connection with the separate phases of the reasoning operation . . ." These are (1) distinguishing the advantageous situations, and analyzing the problem; (2) training in inference, and (3) training in proving the correctness of the inference.

Pillsbury then turns his attention to the entirely different problem of feeling and emotion in education. Again the pertinent psychological facts and theories are first summarized, especially the point of view that emotion is the conscious phase of instinct. Such practical problems as the control and suppression of emotions and their mental hygiene naturally lead to a discussion of discipline. Action and will raise new problems and the author contrasts reflex and voluntary movements. In this connection, the importance of plateaus in learning is considered.

The problem of fatigue is treated in Chapter 14. The fatiguing of the neuromuscular mechanism leads to a discussion of mental

fatigue. Especially emphasized are the metabolic changes during mental work. The curve of work, effects of rest and the practical applications for young children are clearly and concisely treated. The effects of ventilation, tobacco, alcohol and caffeine are pointed out.

After giving an entire chapter to the treatment of formal discipline and the transfer of training, Pillsbury concludes that, from a consideration of the evidence, little transfer is evident. But, on the other hand, specific habits due to training may be used in new contexts rather than the training of a common faculty. Finally, Pillsbury discusses the general effects of education and shows that many specific habits have a general application. In the final chapter, tests of accomplishment in school subjects are given for a number of the subjects in the school curriculum.

This summary, extended though it is, gives only a notion of the topics covered and the order and nature of their treatment. It can give no idea of the lucid, concise style and the interesting presentation and practical suggestions which hold the reader's attention. Such an exposition could only have been made by one who is "a psychologist who has been some thirty years a teacher."

SAMUEL W. FERNBERGER

UNIVERSITY OF PENNSYLVANIA

KARL J. HOLZINGER. *Statistical Tables for Students in Education and Psychology*. Chicago: University of Chicago Press, 1925. Pp. v+74.

"These tables have been prepared to assist students with the ordinary calculations in a first course in educational and psychological statistics. It is assumed that the chief topics in such a course will include averages, dispersion, correlation and uses of the normal curve. . . ." This collection of tables, in a very convenient form, will be of great assistance to the research investigator in psychology and in education as well as to the student. The list comprises the following: (1) squares and square roots (1-1050); (2) products (99×100); quotients ($99 \div 100$ and $100 \div (12)^2$); 4-place logarithms; logarithms of $\sqrt{1-r^2}$; values of $\sqrt{1-r}$; values of X_1 or .6744898

—; probable errors of the product moment correlation coefficient; areas and ordinates of the normal probability curve in terms

of deviates from the mean and deviates and ordinates of the normal probability curve in terms of area from the mean. Such a list of tables should form the basis for almost all calculations involving correlation and the use of material that is not skewed.

SAMUEL W. FERNBERGER

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T. H. PEAR. *Skill in Work and Play*. New York: Dutton, 1925. Pp. 107.

The book presents clearly and simply the important problems in the acquisition of muscular skill. The author presents his material in a not too optimistic fashion but frankly recognizes as unsolved some of the still questionable problems. The book seems to be written primarily for the layman but it may with profit be read by the psychologist who wants to have a clear statement of the existing problems.

The author first analyses muscular experience and comes to the conclusion that "skill in the use of complicated muscle-groups . . . can be called intelligent." In the acquiring of skill, next treated, the facts of integration are emphasized. Indeed, skill is defined as the integration of habits. Pear follows Freeman's description of the different classes of skilled acquirements.

Under the title of the experimental investigation of learning, the author reviews clearly the work that has been done on the practice curve and gives a good deal of space to the plateau and to its causes. After a discussion of the time-motion studies, the author points out that, in industry, ease of operation rather than speed is essential.

In the chapter of Training in Muscular Performances, the author considers, in a practical way, what to teach, how to teach, who should teach, how to learn and the relation between training and education. Temperamental and other differences in both teachers and learners are considered.

In his discussion of Muscular Experience, the author unfortunately publishes the anatomical chart, copies from McDougall which contains the error of having the lower end of the muscle attached just *above* the joint and the upper end of the muscle attached nowhere.

SAMUEL W. FERNBERGER

UNIVERSITY OF PENNSYLVANIA

HOWARD TAYLOR. *Introduction to Educational Psychology. A Manual for an Introductory Course.* Baltimore: Warwick & York, 1925. Pp. 172.

"An attempt to present in outline form the leading facts and problems of educational psychology that are of vital importance in teaching." Each fact and problem is presented in the form of one sentence. They cover the field from the original nature of man to tests and measurements and personality and character. Every odd page is blank for "teachers' notes." As an outline it should be of value in elementary courses of this topic.

SAMUEL W. FERNBERGER

UNIVERSITY OF PENNSYLVANIA

J. WALKER. *Factors Contributing to the Delinquency of Defective Girls.* *University of Cal. Pub. in Psychol.*, 1925, 3, No. 4. Pp. 147-213.

This study concludes an investigation of 246 delinquent girls referred by the San Francisco Juvenile Court to the Psychological Clinic of the California Medical School for examination. The aim was (1) to investigate the existing and antecedent factors which influenced their appearance at a court, (2) to determine the most effective treatment for a delinquent girl.

As delinquency among girls is almost entirely a question of sexual nonconformity, the problem has medical, biological and social significance. From the point of view of hygienics, the defective delinquent girl is the more serious problem. It is interesting to note that most of the physical disorders result from a lack of attention to personal and social hygiene, yet the converse, viz., that irregular conduct directly causes bad physical condition is much more apparent, especially evidenced in the large percentage of cases with venereal disease.

The writer states that apparently "Americanization" of the children, more rapidly than of the parents, leads to a lack of parental control and nonconformity outside the home. Strangely enough, non-American born girls were in the minority in this study. It is very apparent that the investigator feels that the crux of the situation is directly referable to home conditions and that the home environment is responsible for the failure on the part of the girls to conform socially.

Institutional and reformatory incarceration and no marked influence on the most serious offenders since, when no longer under the

control of the court, a large majority failed to accept the proper social standards even after marriage.

Although the writer admits that there are no immediate or automatic therapeutics at hand yet, her suggested standardized program for handling such cases ought to bring about a gradual improvement.

M. E. BROOKE

UNIVERSITY OF PENNSYLVANIA

W. H. PYLE. *Nature and Development of Learning Capacity*. Baltimore: Warwick and York, 1925. Pp. 122.

Another contribution to the psychology of learning has been added recently by W. H. Pyle. For ten years, the author has been carrying on experimental studies of learning among negroes, Indians, Chinese, and white American children in both city and country. His subjects number about fifteen thousand. In the present volume the author reports chiefly his most recent work with subjects ranging from six to eighteen years of age. The tests used are card sorting, marble sorting, manthanometer, substitution, mirror drawing, ideational learning and his own mental tests. With the exception of the mental tests, the above named tests are described more completely in Pyle's "*Laboratory Manual in the Psychology of Learning*" (1923).

The author aims to study the development of learning ability in children from year to year. With one exception, however, the method of study is by means of different groups of children at each age instead of with the same children over a period of consecutive years. The card sorting test was repeated with a group of 183 girls and 200 boys and from the data obtained a study was made of a year's growth in learning capacity made by the same pupils. This method of approach has proved to be of most value in other investigations and further studies using this method will yield, without doubt, results of great value in formulating a more complete knowledge of the psychology of the learning process. Pyle gives norms or tentative norms for each of his tests for boys and for girls, growth curves, comparative tables with regard to age, sex, and race, illustrations of apparatus used, and concludes with his own theory of the psychology of learning.

JULIA A. KIRKWOOD

STATE UNIVERSITY OF IOWA

DOUGLAS FRYER. *Vocational Self Guidance*. Philadelphia: Lip-pincott, 1925. Pp. xvii+385.

Vocational guidance, according to the author of this book, is based upon two simple principles. The first is that exact information must be secured of our vital resources and limitations, of our abilities and special aptitudes, of our ambitions and interests. The second principle is that exact information should be secured of the occupations generally and, in as great detail as possible, of the occupations particularly of interest to us. The point of view of vocational guidance as discussed by this author is what he describes as *enlightened self interest*. It is not guidance into that particular field of labor which society seems to need most; it is guidance from which an individual can realize most in terms of satisfaction and well being.

A few chapters of this book are devoted to descriptions of methods of self measurement which can be used by the individual in obtaining exact data about his vital resources, etc. There are included a self administrative revision of the Army Alpha Tests and a number of self administrative rating scales on health, coöperativeness, leadership, etc. The reader is exhorted to submit himself to these scales of self measurement and to profit from their use. A classification of occupations in terms of the demand made by each on general intelligence is presented, in the hope that the reader may therewith determine for himself the class of occupations in which he can be most successful.

The greater part of the book is devoted to a description of occupations in which there are opportunities for men who rate as high as A or B in general intelligence. It is pointed out that men with an intelligence rating lower than these would find difficulties in doing successful work in this occupation. The description of each occupation is written by a leading specialist in that field. In many of these descriptions is found a great deal of interesting information, but in few of them is the occupation analyzed in a manner which makes the description serviceable for use in either self guidance or any other kind of guidance. A chapter, written by Lorine Pruette, is devoted to business professions for women.

In general the usefulness of the methods of self measurement provided by the author is described in moderate terms. The claims made are hedged about with reservations. As a matter of fact, the book is described not as a scientific treatise, but as a common sense contribution to self guidance. Written by another but a reputable psycholo-

gist this volume could be passed by without further comment, but the name of a psychologist on the title page awakens expectations for at least a differentiation between that which is scientific and that which is not scientific. These expectations are unfortunately not realized.

MORRIS S. VITELES

UNIVERSITY OF PENNSYLVANIA

J. E. W. WALLIN. *The Education of Handicapped Children*. Houghton Mifflin Co., 1924. Pp. 394.

Dr. Wallin has divided his book into three parts, the history of the education of handicapped children and psychological theories and definitions of feeble-mindedness; public school questions relating to the education of handicapped children; and the social menace of the feeble-minded, and the program of constructive endeavor in their behalf, with an appendix giving various classifications of mentally deficient children. Although primarily concerned with feeble-minded children, the book touches briefly on some other forms of handicaps.

The essential criterion of feeble-mindedness accepted is socio-industrial incompetency and dependency. A conservative standard is used in classifying feeble-mindedness and the author believes that according to the accepted definition not more than one-half of one per cent of the pupils enrolled in the elementary schools are definitely feeble-minded.

He advocates two types of classes in the public schools for those who are mentally deficient; special classes segregated in a separate building for the definitely feeble-minded; and other ungraded classes centralized in the usual grade buildings for borderline, backward and restoration cases. The curriculum advocated allows for much latitude and adaptation to the individual, laying much stress on physical and health training and instruction in industrial arts but not ignoring the literary branches except with low grade cases. Suggestions as to vocational guidance, adaptations of methods of teaching applicable to mental deficients, and the qualifications of the teacher of such children are discussed.

In part three the relation of feeble-mindedness to high fecundity, degenerate progeny, criminality, inebriety, prostitution, pauperism and vagrancy is considered. Although he believes that such relations have been frequently overestimated, his conclusion is that the existence of the class of the feeble-minded is of vital concern to society because of their possible social menace when without proper super-

vision. But he believes it improbable that they do not have a real place in society in performing certain routine tasks. An adequate program of their care must involve identification of the feeble-minded, medical care and supervision from the time of birth and developmental training.

MADORAH E. SMITH

STATE UNIVERSITY OF IOWA

FLOYD HENRY ALLPORT. *Social Psychology*. Boston: Houghton Mifflin, 1924. Pp. xiv+453. \$2.50.

Professor Allport has made the most distinctive contribution to the growing list of textbooks on social psychology which has yet appeared. In one sense it may be said to be the only social psychology yet written, for it is the only textbook which sticks rigorously to the viewpoint that social psychology is the psychology of the individual behaving in and with reference to social situations. Whether we agree with the proposition that it is the only social psychology, strictly speaking, depends on the definition of that subject. If we assume that social psychology is a special phase of individual psychology, the assertion is entirely capable of being defended.

Professor Allport is decidedly consistent in his viewpoint regarding the scope of the science of social psychology. It is the consciousness of the individual that is being studied in social psychology as well as in individual psychology. "There is no psychology of groups which is not essentially and entirely a psychology of individuals. . . . There is likewise no consciousness except that belonging to individuals." In this contention he is undoubtedly sound. In his first chapter he makes war rather strenuously against the "group mind" fallacy, and those who speak of the collective behavior of groups as if the groups themselves had consciousness and behaved as conscious organisms. He tells us that there is no "crowd mind" or "collective, or class, mind." All of the other social psychologists would doubtless agree with him in regard to this proposition. Where, then, is the difficulty, where is the conflict of views?

The conflict is only an apparent one. When analyzed, it disappears. Professor Allport is concerned with different subject matters than the other writers on social psychology. The latter have approached the subject from the sociological and the anthropological angles. They have been concerned with the explanation of sociological phenomena in psychological terminology. This can be said of Professor Cooley in his *Human Nature and the Social Order* less

than of any of the other writers, but it is true of the latter part of that book and also of his *Social Organization*. These books have had the problem of accounting for collective or group phenomena, and they have for the most part taken over the terminology which applies properly to the behavior of the individual and have applied it to uniformities of behavior in groups as wholes. Hence, the group fallacy.

Professor Allport, on the other hand, like the psychologist he is, has begun at the individual behavior end, and has attempted to explain the behavior of individuals in groups and in other social contacts. Ultimately, it would seem, the social psychologists with the sociological interest must build upon work of the type Allport is doing. Doubtless they would have been willing to do this, if such work had existed when they wrote. But social psychology did not begin in that way. It was initially the product of the social sciences groping for some explanation of collective behavior in the terminology of antecedent sciences before those antecedent sciences were equipped to offer the information and terminology required of them. This sort of premature demand of the social sciences, especially of sociology, upon antecedent sciences has occurred with reference to biology almost as insistently as with reference to psychology. And biology has been as little prepared to make an adequate answer in terms of theory. But the error which arose out of the premature demands of sociology and education upon biology was a very different one from that which occurred in connection with the demands of sociology upon psychology. Sociology asked of biology an explanation of the behavior of the individual and received the theory of instincts. Biology had not adequately studied human behavior, and its reply, made from the standpoint of the biologists' researches in connection with lower forms of life, proved erroneous. In this case the sociologists and the psychologists corrected the biologists' error in revising the theory of instincts as it applied to human behavior. But in the other case the sociologists themselves made the error of misapplying psychological terminology, and it remained for the psychologists to correct this error. The work of Allport in offering a new approach to the study of collective behavior will be adequately appreciated by the sociologists and they will make use of it fully for this purpose.

Allport's definition of social psychology as "the science which studies the behavior of the individual in so far as his behavior stimulates other individuals, or is itself a reaction to their behavior; and which describes the consciousness of the individual in so far as it is a

consciousness of social objects and social reactions," has aroused some controversy and criticism. Does this definition assume that it is not the province of social psychology (as Allport understands that term) to study the behavior of groups? The reviewer does not understand that Allport would make any such contention, although he would probably prefer to speak of the behavior of men *in* groups. In fact, in his last chapter he does undertake analyses, rather brief to be sure, of collective aspects of behavior, and I believe it is no secret that he intends at some time to produce a second volume which will carry his analyses further in this direction.

The reviewer has spent so much time on questions of scope and method because most criticism of this book has been directed against these points. Allport has himself definitely raised the issue in his first chapter, as well as in other writings. I believe the difficulty has been exaggerated. The problem is primarily one of the adjustment of terminology and of causing the two extremes of social psychology represented by Allport and the sociological writers of social psychology to make connections on a common ground between. This is another one of those cases in which the first stages of the analysis of the subject came after what should have been, logically, the later stages of the development of the science. This was so because there was, in the late nineteenth and early twentieth centuries an overwhelmingly insistent demand for sociological analysis to make clear to men the meaning of their society and of the social forms and processes in which they found themselves involved.

Of the plan of treatment of the book—within the limits set for himself by the author—there has been but little criticism and, I think, rightly. Some have found fault with his "prepotent impulses," under cover of which they claim to find the old instincts hiding. I do not understand this to be the case. Where he conceives of the prepotent impulses as native he undoubtedly thinks of them as reflexes and as physiological conditions which render the organism active. The environment is by no means disregarded. However, one sometimes wonders just how clearly he sees the influence of environmental patterns in determining what impulses are to be released and what ones repressed.

The treatments of emotion and of the organization of the personality are among the strongest assets of the book. Much of his work as a psychologist has been in the field of analyzing and measuring personality traits. His classification is one of the best and his sug-

gestions for personality analysis and control are very clear and practical, as well as sound. The slight leaning toward some of the interpretations of the psychoanalysts has been criticised, but the reviewer believes more on the basis of prejudice than of fact. It would be very surprising if psychoanalysts had not made some valuable practical observations as a result of their intimate contacts with cases of neurosis, however poor their theoretical explanations may be. Professor Allport has not accepted any of this theory uncritically.

The emphasis in this book upon language as a means of social stimulation is entirely in keeping with the better and more recent tendencies in social psychology. The emphasis upon language has previously been largely from the sociological and anthropological standpoints. Its importance for social psychology is now beginning to be seen. The development of social psychology in the future will probably be more rather than less strikingly in this direction.

Other modes and forms of contact—sympathy, imitation, suggestion, laughter—come in for analysis. In common with most psychological writers, Professor Allport sees little justification for the retention of the concept of imitation. Psychologically he is doubtless correct in believing that the phenomena of imitation can be distributed to other categories. But sociologically the concept is still very useful. In fact it is, and always has been, a sociological concept and grew up because of its use in the science of sociology. Perhaps Professor Allport would not deny this, but would reply that he has written a social Psychology, not a sociology. Much of the feeling of irritation of the sociologists toward this book is doubtless due to the way in which the author ignores or contends against sociological concepts. If there were more clearness with regard to the delimitations of the two fields much of this irritation would perhaps disappear.

The analysis of the attitudes built up in individuals under the influence of group stimuli is, the reviewer believes, the best composite presentation in the literature of social psychology, although it might well be greatly expanded.

The book is a very marked contribution to the literature of the field and sets a standard which must be lived up to by future writers. But, as the writer himself probably recognizes, it covers only one aspect of the general subject. It does not go beyond the account of behavior patterns in individuals. It does not offer an adequate

account of how individuals behave collectively. Perhaps a second volume from the same writer will do this. Or, will the sociologists take the cue and supply this omission? As it stands, it is a textbook for classes in psychology rather than for classes in social psychology in departments of sociology.

L. L. BERNARD

CORNELL UNIVERSITY.

BURNHAM, W. H. *The Normal Mind: An Introduction to Mental Hygiene and the Hygiene of School Instruction*. N. Y.: Appleton, 1924. Pp. xv+702.

In this volume an eminent student of human nature presents a consistent and scientific exposition of certain fundamental phases of what Professor Titchener has called, "the mind at work."

The first portion of the book contains what seems to the reviewer to be the most complete and constructively critical exposition of the conditioned reflex in its relation to mental life that is available. This mechanism is presented as typical of the physiological basis of association. The general principles of association, moreover, are once again shown to be of the utmost importance not only for an understanding of general and applied psychology, but also for pedagogy and mental hygiene. The formation of habits, or systems of conditioned reflexes, is considered as a process of true integration. In this book association is no "bundle-hypothesis," to use Professor Wertheimer's phrase. Rather, in the term *integration* there is an explicit recognition of the same unique significance of totality which has been so ably emphasized of late by the "configurationists." "An integer," Professor Burnham says (p. 32), "is a unit; we are familiar with it in the study of integral numbers. An integer has not been broken up into fractions. . . . Coördination puts emphasis on the parts united, integration on the whole which results from the integration of the parts."

Under the simple appellation of *the task* the author denotes any occupation in work or play which involves among other factors the interested activity of the individual. Around this conception of the task the author synthesizes much that is good in the various vociferously contending "movements" in the child psychology and the theoretical pedagogy of the day. From the "method" of Mme. Montessori, the "project," the "problem," "psychoanalysis" and the "Dalton Plan," the author with remarkable patience has isolated

some grain and discarded much chaff. He emphasizes the strong points of tendencies and gives a minimum of unfavorable criticism even to the most bizarre fads.

In his consideration of the "social task" the author offers an evaluation of tests of intelligence, personality, and achievement. His treatment is timely and in admirable perspective. The values of these new tools of education are given due recognition. Professor Burnham, however, has too profound a knowledge of the physiology and the psychology of the developing individual to believe that the only necessary "open sesame" to the secret doors of the house of life is the incantation of the magic numbers of Pearsonian statistics.

In a treatment of mental attitudes the author presents certain practical applications of the findings of the Würzburg school. For education the importance of the *Einstellung* is made clear. In this connection the process of suggestion is defined, following Professor Titchener, as a process dependent upon the touching off of a determining tendency. The alternative view which reduces *determining tendency, attitude*, and the like to the simpler formula of physiological association is not made clear. This is the more surprising in an author who has demonstrated so thorough an acquaintance with the conditioned reflex.

Many important physiological and psychological data are presented in the chapters of the work which bear in their headings the word *inhibition*. The material is relevant and valuable. However, the reviewer is not sure that, for example, the action of the vagus on heart muscle, the physiological basis of sleep, and the removal of oppressive associations, are phenomena sufficiently related to be considered under a single heading. They may be so related: the evidence, as yet, does not prove it. Professor Burnham, surely, would be the last one to exalt a word into a faculty; but there is a danger that the layman, for whom *The Normal Mind* is in part at least intended, may make this mistake in reading the chapters on inhibition.

It is particularly significant of the modern tone of the volume, that the word instinct does not appear in the index. Likewise in the pages of the book there is no propitiation of unsolved problems by lip service to a vague concept of heredity.

The last chapters consist in a bringing-together and application of the conceptions developed in the earlier portions of the work. Here the importance of orderly association and of real discipline are emphasized. In a chapter on "Pseudo-feeble-mindedness" an im-

portant distinction is brought out between permanently arrested development and development which has only been delayed because of certain conditions which may be removed if proper remedial measures are adopted.

From medicine and theology, literature and physiology, "imageless thought" and "configurationism," mental tests and the "self-psychology," "behaviorism" and Kant, as well as from innumerable other sources, Professor Burnham has collected the materials which make up his volume. Some notion of the extent of the ground covered may be gained from the fact that the index contains almost two thousand references. The book, however, is no mere compilation: it has a unity which comes from strict adherence to the scientific point of view. Thus, with deft eclecticism, with sincerity and with humor Professor Burnham has prepared a handbook which will long be cherished by the large company of those who study or deal with the mind in use.

LEONARD CARMICHAEL

PRINCETON UNIVERSITY.

RESOLUTION

At the twenty-third annual meeting of Experimental Psychologists, held at the University of Pennsylvania, April 5-7, 1926, the following resolution was passed:

Resolved, that this meeting deplores the increasing practice of collecting administrative or supposedly scientific data by way of questionnaires; and

That the meeting deplores especially the practice under which graduate students undertake research by sending questionnaires to professional psychologists.

EDWIN G. BORING,
Harvard University

SAMUEL W. FERNBERGER,
University of Pennsylvania.

HERBERT S. LANGFELD,
Princeton University

E. S. ROBINSON,
University of Chicago

E. B. TITCHENER,
Cornell University

R. S. WOODWORTH,
Columbia University

NOTES AND NEWS

UPON the recommendation of the Finnish Academy of Science, the Government of Finland has made an official grant of 5,000 Marks towards the maintenance of the international periodical for psychology, *Scandinavian Scientific Review*, edited by Dr. Martin L. Reymert, aided by an advisory board in each of the Scandinavian countries.

PROFESSOR HARRY P. WELD has been granted leave of absence from Cornell University for the second term, 1926-1927.

THE Board of National Research Fellowships in the Biological Sciences have made the following appointments for psychology for the year 1926-1927: Reappointments: T. N. Jenkins, M. F. Metfessel and L. E. Travis. New appointments: D. Brunswick, E. D. Hutchinson, W. C. Olsen and P. T. Young.

DR. V. A. C. HENMON, director of the school of education at the University of Wisconsin, has accepted an appointment as professor of educational psychology at Yale University.

DR. MORTON PRINCE has been appointed associate professor of abnormal and dynamic psychology at Harvard University.

